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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/825,032

04/14/2004

Darin P. Haudrich

022000-001700US

7376

55132

7590

04/12/2007

WILDMAN HARROLD ALLEN & DIXON LLP  
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EXAMINER

COUGHLAN, PETER D

ART UNIT

PAPER NUMBER

2129

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

04/12/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Non-Final  
Due 7/12/2007

## Office Action Summary

Application No.

10/825,032

Applicant(s)

HAUDRICH ET AL.

Examiner

Peter Coughlan

Art Unit

2129

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(e). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 05 February 2007.  
2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-50 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-50 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 14 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-546)  
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

### Detailed Action

1. This office action is in response to an AMENDMENT entered February 5, 2007 for the patent application 10/825032 filed on April 14, 2004.
2. All previous Office Actions are fully incorporated into this Non Office Action by reference.

### Status of Claims

3. Claims 1-50 are pending.

### 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-50 are rejected under 35 U.S.C. 101 for nonstatutory subject matter. The computer system must set forth a practical application of that § 101 judicial exception to produce a real-world result. Benson, 409 U.S. at 71-72, 175 USPQ at 676-77. The invention is ineligible because it has not been limited to a

substantial practical application. Although the invention produces aeroelastic analysis results, this is still not a practical application. Depending how these results are to be employed might be a practical application. As the claims are written, aeroelastic results are produced but no tangible real world practical application has been stated. The result has to be a practical application. Please see the interim guidelines for examination of patent applications for patent subject matter eligibility published November 22, 2005 in the official gazette.

In determining whether the claim is for a "practical application," the focus is not on whether the steps taken to achieve a particular result are useful, tangible and concrete, but rather that the final result achieved by the claimed invention is "useful, tangible and concrete." If the claim is directed to a practical application of the § 101 judicial exception producing a result tied to the physical world that does not preempt the judicial exception, then the claim meets the statutory requirement of 35 U.S.C. § 101.

There needs to be a reason, purpose or practical application for the generation of aeroelastic analysis results. For example, one reason to produce aeroelastic analysis results after a repair has been completed might be to determine if the repair of a structure would result of the structure to fall within acceptable performance characteristics of the structure. Such results have not been claimed.

The invention must be for a practical application and either:

- 1) specify transforming (physical thing) or
- 2) have the FINAL RESULT (not the steps) achieve or produce a

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useful (specific, substantial, AND credible),  
concrete (substantially repeatable/ non-unpredictable), AND  
tangible (real world/ non-abstract) result.

A claim that is so broad that it reads on both statutory and non-statutory subject matter, must be amended, and if the specification discloses a practical application but the claim is broader than the disclosure such that it does not require the practical application, then the claim must be amended.

A result of aeroelastic analysis is a set of numbers or Boolean results. How these values are to be used in a practical application have not been stated. At this point, the claims are an exercise only and do not state a practical application. There must be a result that is a practical application.

### ***Response to Arguments***

5. Applicant's arguments filed on February 5, 2007 for claims 1-50 have been fully considered but are not persuasive.

6. In reference to the Applicant's argument:

On December 5, 2006, an amendment was filed in response to the final Office Action of October 5, 2006. On December 21, 2006, an Advisory Action was mailed in which the amendment of December 5, 2006, was entered but none of the pending claims were allowed. Claims 1-13 and 17-30 are pending in the application. Independent claims 1, 17, 21, 28, 29, and 30 have been amended.

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New dependent claims 31-55 have been added. Reconsideration of the present application in view of the amendments and the following remarks is respectfully requested.

#### Claim Rejections – 35 U.S.C. §103(a)

Independent claims 1, 21, 28, and 30 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Adaptive nonlinear neural network controller for rotorcraft vibration by Spencer et al., 1997, SPIE Vol 3041, 538-553, (hereinafter referred to as "Spencer"), in view of Small Business Innovation Research to Support Aging Aircraft, Priority Technical Areas and Process Improvements, published by the National Academy of Sciences, Publication NMAB-497 (hereinafter referred to as "NMAB-497"). Applicant respectfully submits that independent claims 1, 21, 28, and 30 have been amended such that they are patentable over Spencer in view of NMAB-497.

Independent claim 1, as amended, recites "an input module configured to receive one or more input parameters associated with aeroelastic characteristics of a structure, the one or more input parameters relating to a completed repair of the structure." Neither Spencer nor NMAB-497 teach or suggest at least input parameters relating to a completed repair of the structure.

Spencer discloses a rotor blade vibration control system and has nothing to do with using neural networks to analyze repairs or completed repairs at all. While NMAB-497 uses the word repair in various places in the article, it does not teach or suggest at least using a neural network to perform aeroelastic analysis of completed repairs. At most, NMAB-497 mentions using neural networks to identify damage, such as corrosion, to determine whether a repair is necessary. These distinctions are important in part because neither the individual teachings nor the combined teachings of Spencer and NMAB-497 provide the advantages of decreasing the downtime associated with aeroelastic analysis of completed repairs on structures, such as aircraft. Therefore, even if a combination of Spencer and NMAB-497 were made, which Applicant does not concede is proper, the purported combination still would not disclose all of the elements of independent claim 1. As a result, independent claim 1 is allowable over Spencer in view of NMAB-497. Claims 2-13 and new claims 31-35 which depend from allowable independent claim 1 are therefore also allowable.

Independent claim 21, as amended, recites "receiving at least one input parameter related to a completed repair of an aircraft structure." Neither Spencer nor NMAB-497 teach or suggest at least input parameters relating to a completed repair of an aircraft structure. Applicant hereby respectfully reiterates the remarks set forth above regarding independent claim 1. Therefore, even if a combination of Spencer and NMAB-497 were made, which Applicant does not concede is proper, the purported combination still would not disclose all of the elements of

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independent claim 21. As a result, independent claim 21 is allowable over Spencer in view of NMAB-497. Claims 22-27 and new claims 42-44 which depend from allowable independent claim 21 are therefore also allowable.

Independent claim 28, as amended, recites "receiving at least one input parameter related to a completed repair of an aircraft structure." Neither Spencer nor NMAB-497 teach or suggest at least input parameters relating to a completed repair of an aircraft structure. Applicant hereby respectfully reiterates the remarks set forth above regarding independent claim 1. Therefore, even if a combination of Spencer and NMAB-497 were made, which Applicant does not concede is proper, the purported combination still would not disclose all of the elements of independent claim 28. As a result, independent claim 28 is allowable over Spencer in view of NMAB-497. New claims 45-48 which depend from allowable independent claim 28 are therefore also allowable.

Independent claim 30, as amended, recites "means for receiving input parameters relating to a completed repair of an aircraft structure." Neither Spencer nor NMAB-497 teach or suggest at least input parameters relating to a completed repair of an aircraft structure. Applicant hereby respectfully reiterates the remarks set forth above regarding independent claim 1. Therefore, even if a combination of Spencer and NMAB-497 were made, which Applicant does not concede is proper, the purported combination still would not disclose all of the elements of independent claim 30. As a result, independent claim 30 is allowable over Spencer in view of NMAB-497. New claims 52-55 which depend from allowable independent claim 30 are therefore also allowable.

Independent claims 17 and 29 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Spencer and NMAB-497 in view of PhD dissertation Aeroelasticity of Morphing Wings Using Neural Networks of Arland Natarajan, 2002, (hereinafter referred to as "Natarajan"). Applicant respectfully submits that independent claims 17 and 29 have been amended such that they are patentable over Spencer and NMAB-497 in view of Natarajan.

Independent claim 17, as amended, recites "determining input parameters relating to one or more completed repairs performed on a structure." Neither Spencer nor NMAB-497 teach or suggest at least input parameters relating to a completed repairs performed on a structure. Applicant hereby respectfully reiterates the remarks set forth above regarding independent claim 1. In addition, Natarajan does not teach or suggest at least input parameters relating to one or more completed repairs performed on a structure. Therefore, even if a combination of Spencer, NMAB-497, and Natarajan were made, which Applicant does not concede is proper, the purported combination still would not disclose all of the elements of independent claim 17. As a result, independent claim 17 is allowable over Spencer and NMAB-497 in view of Natarajan. Claims 18-20 and new claims 36-41 which depend from allowable independent claim 17 are therefore also allowable.

Independent claim 29, as amended, recites "receiving a mass input related to a completed repair." Neither Spencer nor NMAB-497 teach or suggest at least receiving a mass input related to a completed repair. Applicant hereby respectfully reiterates the remarks set forth above regarding independent claim 1. In addition, Natarajan does not teach or suggest at least at least receiving a mass input related to a completed repair. Therefore, even if a combination of Spencer, NMAB-497, and Natarajan were made, which Applicant does not concede is proper, the purported combination still would not disclose all of the elements of independent claim 29. As a result, independent claim 29 is allowable over Spencer and NMAB-497 in view of Natarajan. New claims 49-51 which depend from allowable independent claim 29 are therefore also allowable.

Newly added claims provide further distinction from Spencer, NMAB-497, and Natarajan. For example, with regard to new dependent claims 32, 37, 42, 45, 49, and 52, Spencer, NMAB-497, and Natarajan certainly do not teach or suggest at least performing an aeroelastic analysis on a completed repair after the repair is completed and before the structure is used in flight. Also, for example, with regard to new dependent claims 35, 41, 44, 48, 51, and 55, Spencer, NMAB-497, and Natarajan certainly do not teach or suggest at least the use of inputs of weight and the location of the weight relating to completed repairs performed on a structure which exceed a predetermined category of approved repair parameters.

Examiner's response:

All rejections using Spencer, NMAB-497, Natarajan have been withdrawn by the Examiner.

### ***Examination Considerations***

7. The claims and only the claims form the metes and bounds of the invention. "Office personnel are to give the claims their broadest reasonable interpretation in light of the supporting disclosure. *In re Morris*, 127 F.3d 1048, 1054-55, 44USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. *In re*



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*Prater*, 415 F.2d, 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969)\* (MPEP p 2100-8, c 2, I 45-48; p 2100-9, c 1, I 1-4). The Examiner has the full latitude to interpret each claim in the broadest reasonable sense. Examiner will reference prior art using terminology familiar to one of ordinary skill in the art. Such an approach is broad in concept and can be either explicit or implicit in meaning.

8. Examiner's Notes are provided to assist the applicant to better understand the nature of the prior art, application of such prior art and, as appropriate, to further indicate other prior art that maybe applied in other office actions. Such comments are entirely consistent with the intent and spirit of compact prosecution. However, and unless otherwise stated, the Examiner's Notes are not prior art but link to prior art that one of ordinary skill in the art would find inherently appropriate.

9. Examiner's Opinion: Paragraphs 7 and 8 apply. The Examiner has full latitude to interpret each claim in the broadest reasonable sense.

### ***Conclusion***

10. The prior art of record and not relied upon is considered pertinent to the applicant's disclosure.

-Boeing's MEDA maintenance program

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-'An improved neural network model for nonlinear aeroelastic analysis':

Voitcu

-'A neural network approach for nonlinear aeroelastic analysis': Voitcu

-'Parameter estimation of an aeroelastic aircraft using neural networks':

Raisinghani

11. Claims 1-50 are rejected.

***Correspondence Information***

12. Any inquiry concerning this information or related to the subject disclosure should be directed to the Examiner Peter Coughlan, whose telephone number is (571) 272-5990. The Examiner can be reached on Monday through Friday from 7:15 a.m. to 3:45 p.m.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor David Vincent can be reached at (571) 272-3080. Any response to this office action should be mailed to:

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401 Dulany Street,

Alexandria, Virginia 22313,

(located on the first floor of the south side of the Randolph Building);

or faxed to:


(571)-272-3150 (for formal communications intended for entry.)

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Peter Coughlan

4/10/2007



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